May 20, 2016

**MEMORANDUM**

TO: The Public Service Commission
FROM: Robin Arnold, Neil Templeton
SUBJECT: FACT SHEET Docket D2015.8.64, Greycliff petition for QF contract rates and terms

PURPOSE

Prior to a public hearing on a docketed matter before the Public Service Commission (Commission), Regulatory Division staff on the work team prepare a Fact Sheet that summarizes the application and the prefiled testimony. A hearing in this docket is scheduled for Tuesday, May 31, 2016 in Helena.

BACKGROUND

On August 17, 2015, Greycliff Wind Prime, LLC (Greycliff), filed a *Petition to Have Commission Set Contract Terms and Conditions Pursuant to MCA § 69-3-603* (Petition).

On August 20, 2015, the Commission issued a *Notice of Petition and Intervention Deadline*. On September 4, 2015, Greycliff filed a *Motion for Summary Judgment on the Legal Issue of Whether NorthWestern Energy has an Obligation to Negotiate in the Absence of All Source Competitive Solicitation Set Forth in ARM 38.5.1902(5)* (Motion).

On September 9, 2015, the Commission granted intervention to NorthWestern Energy (NorthWestern) and the Montana Consumer Counsel (MCC). On September 10, 2015 the Commission issued *Procedural Order 7436.*

On September 18, 2015, Greycliff submitted *Prefiled Direct Testimony of Robert Stanton Walker*. On October 16, 2015, Greycliff responded to data requests (DR) NWE-001 through NWE-013 from NorthWestern, and DR PSC-001 through PSC-011 from the Commission.

On November 16, 2015, NorthWestern submitted *Prefiled Response Testimonies of Bleau J. LaFave and Luke P. Hansen,* and MCC submitted *Prefiled Direct Testimony of Jaime T. Stamatson.* On November 19, 2015, NorthWestern submitted *Prefiled Additional Response Testimony of Bleau J. LaFave.*

On December 9, 2015, NorthWestern responded to DR GWP-001 through GWP-011 from Greycliff, and DR PSC-012 through PSC-029 from the Commission.

On January 15, 2016, NorthWestern submitted *Prefiled Supplemental Response Testimonies of Bleau J. LaFave and Patrick J. DiFronzo.*

On November 4, 2015, the Commission heard oral arguments on Greycliff's September 4 Motion. On January 15, 2016, the Commission issued *Order No. 7463b* denying the Motion and directing

NorthWestern and Greycliff to negotiate for at least thirty days "in an effort to mutually agree to contract terms and conditions, including an avoided cost rate". Order No. 7463b ¶ 23 (Jan. 15, 2016).

On January 16, 2016 and February 26, 2016, Greycliff requested, and the Commission subsequently granted, additional time to conclude negotiations. On March 15, 2016, Greycliff filed a *Notice that Negotiations with NWE have concluded without Agreement and Request to Re-Establish Procedural Schedule*. On March 25, 2016, the Commission issued *Amended Procedural Order No. 7436c*.

On March 29, 2016, NorthWestern submitted *Prefiled Revised Supplemental Response Testimonies of Bleau J. LaFave and Luke P. Hansen.* On April 4, 2016, the Commission withdrew DR PSC-034 through PSC-046. On April 20, 2016, NorthWestern responded to DR GWP-012 from Greycliff, and DR PSC-047 through PSC-055 from the Commission.

On April 29, 2016, Greycliff submitted *Prefiled Rebuttal Testimony of Roger Schiffman*. On May 18, 2016, Greycliff responded to DR NWE-14 through NWE-36 from NorthWestern, and DR PSC-056 through PSC-066 from the Commission.

SUMMARY OF PREFILED TESTIMONY

1. Greycliff Direct - Robert S. Walker

Robert Walker, Executive Vice President of National Renewable Solutions, LLC, prefiled direct testimony on behalf of Greycliff regarding avoided costs. Walker explained how Greycliff derived its offered contract rate. He testified that Greycliff's offered rate was $53.85/MWh, less $3.50/MWh for wind integration, implying an effective rate of $50.35/MWh, levelized over a 20 year term. Walker testified that this rate was based on Bleau LaFave's testimony in Docket No. D2015.2.18 that Greycliff's 25-year levelized avoided cost is $48.40/MWh with RECs, excluding regulation. Greycliff believed this contract rate was acceptable to NorthWestern because in D2015.2.18 NWE determined that Greycliff's CREP proposal was cost effective based on the methodology applied in Docket No. D2014.4.43 (Greenfield docket), and was lower than the QF-1 Tariff rate.

Walker stated that Greycliff's QF proposal differs from its prior CREP proposals; the QF proposal achieves greater economies of scale through an increased project size, from 20 MW to 25 MW. Due to the larger size, Greycliff also had to sign a Large Generator Interconnection Agreement instead of a Small Generation Interconnection Agreement.

Walker stated that Greycliff's proposed contract rate of $50.35/MWh without wind integration is reasonable because it is similar to the Greenfield rate of $50.49/MWh. In addition, he stated that it is in line with other estimates of avoided cost considered by the Commission in the Greenfield docket, which ranged from $47.41/MWh to $54.83/MWh in six estimates of avoided costs described in Order 7347a.

2. NorthWestern Energy Response - Luke P. Hansen

Luke Hansen, an analyst in NorthWestern's Energy Supply Division, prefiled response testimony to detail the energy and capacity rate calculated for the Greycliff project using the PowerSimm™ model.

Hansen testified that PowerSimm modeled the hourly dispatch of NorthWestern's supply portfolio and compared the output to the hourly dispatch of the supply portfolio plus Greycliff. The comparison allowed NorthWestern to determine, for each hour that Greycliff produced electricity, whether its modeled portfolio without Greycliff was short or long.

Hansen testified that when the modeled portfolio was short, the avoided cost was based on the market price for the energy that NorthWestern would otherwise have purchased. When the portfolio was long and the modeled market price was greater than CU4 variable cost, the avoided cost was based on CU4 variable cost, because that is the resource that can be backed down to account for Greycliff production. When the portfolio was long and the market price was less than CU4, the avoided cost was based on the market price because that is the price NorthWestern would likely receive for sales of the excess energy.

Hansen stated that Greycliff's value weighted hourly production was averaged over each year, discounted, and levelized to derive NorthWestern's proposed avoided cost rate.

3. NorthWestern Energy Response - Bleau J. LaFave

Bleau LaFave, NorthWestern's Director of Long Term Resources, prefiled response testimony regarding NorthWestern's position on avoided costs and contract terms. LaFave provided two avoided cost rates, both levelized for 25 years, one with a carbon adder and one without. Both rates were adjusted for integration costs and real time pricing.

LaFave testified that NorthWestern estimated the rates using a differential revenue requirements (DRR) method based on PowerSimm model runs. LaFave stated that the revenue requirement of NorthWestern's resource portfolio was modeled with and without Greycliff production. The difference in revenue requirements informed its estimate of avoided cost. The method reflected the fact that Greycliff production would offset market purchases and production from owned resources in some hours. The revenue difference yielded avoided costs of $33.66/MWh without carbon and $42.82/MWh with a carbon adder.

LaFave testified that NorthWestern deducted regulation and capacity costs from these estimates to arrive at proposed rates of $29.43/MWh without carbon and $38.58/MWh with carbon. He stated that PURPA does not require NorthWestern to purchase the environmental attributes of a QF, but that if Greycliff were willing to convey all current and future attributes to the utility, NorthWestern would be willing to pay the higher rate.

LaFave adjusted avoided costs for intermittency using a day-ahead vs. real-time deduction. He argued that the historic difference between day-ahead firm prices and real-time prices represents

the value discount of non-dispatchable energy, or the value that customers receive in securing firm, day-ahead delivery contracts. Response to DR PSC-054a. He stated that the day-ahead vs. real-time and the supplemental services charges are an attempt to simulate the charges required to firm the intermediate resource similar to the capacity reductions in previous dockets. *Id*.

LaFave testified that it doesn't matter that NorthWestern had found Greycliff's CREP offer cost effective in Docket D2015.2.18 because avoided costs and cost effectiveness are not equivalent. He stated that cost effectiveness is a regulatory concept designed to compare the price of a project to other utility resources, and that QF avoided cost estimates are not reviewed for cost effectiveness.

LaFave testified that in Docket D2015.2.18 Greycliff's $49.02/MWh CREP bid was higher than the calculated avoided cost for the project of $45.01/MWh. In response to DR PSC-019d LaFave stated that if NorthWestern's portfolio is in a long position and the market price is higher than the generator's variable cost, the avoided cost is the generator's variable cost, while the higher market price is cost effective. He added that PURPA was not intended to put a utility's customers in the position of being a market hedge for a QF contract.

LaFave claimed that the avoided cost rate calculated by NorthWestern for the Greycliff project in a prior CREP docket is not appropriate in this proceeding because that rate does not reflect NorthWestern's current avoided cost. He noted that market prices have decreased and that the previous avoided cost was based on a 20 MW, rather than 26 MW, wind project.

LaFave opposed using avoided cost calculations made for the Greenfield project as a test of reasonableness. He asserted that the Greenfield rate of $53.99/MWh was a negotiated rate in settlement of a contested case before the Commission, and did not reflect the avoided cost rate proposed by NorthWestern in that proceeding. He stated that some of the inputs to avoided cost calculations have changed since the Greenfield case, including electricity and natural gas price forecasts, escalation rates, project output, the basis for regulation costs, and the addition of the Greenfield project to the portfolio.

LaFave disputed Greycliff's contention that it established a legally enforceable obligation (LEO). He claimed that the Commission's Order No. 6444e, ¶ 47, specifies that a QF can establish an LEO only if it tenders an executed power purchase agreement to the utility, including a price term that is consistent with the utility's avoided costs, other terms that guarantee performance and period, and an executed interconnection agreement. LaFave testified that Greycliff did not sign a contract to deliver energy at NorthWestern's avoided cost, and did not ask NorthWestern for its current avoided cost calculations.

LaFave prefiled additional response testimony describing non-price terms that NorthWestern would support, and presenting contract revisions to accompany an avoided cost rate with carbon adder. NorthWestern opposed certain terms and conditions in the contract Greycliff offered in July 2015. LaFave stated that the terms of greatest concern to NorthWestern were the annual net energy amount threshold, curtailment rights, creditable hours, remedies and damages, and an

obligation to provide electrical service to Greycliff. LaFave testified that the parties could further negotiate these terms and bring any unresolved terms before the Commission.

On March 14, 2016, Greycliff filed notice with the Commission that negotiations had concluded without agreement. The notice stated that most of the contract terms had been resolved by the parties, and that remaining issues would require legal resolution by the Commission.

LaFave prefiled supplemental response testimony to update NorthWestern's avoided cost calculation for Greycliff through deduction of identified interconnection network costs. He testified that NorthWestern had determined that the project would necessitate $3.57 million of interconnection network upgrades, largely substation upgrades. He stated that Greycliff would furnish the initial funding for these upgrades, and that NorthWestern Transmission would later reimburse Greycliff with interest, as required by its Open Access Transmission Tariff. NorthWestern could recover this reimbursement from customers through rates following Commission approval in a general rate case.

LaFave argued that Commission Order No. 7108e authorized NorthWestern to apply FERC interconnection rules to QFs, and that FERC has stated that transmission and distribution costs directly related to the installation and maintenance of interconnection facilities may be included in the avoided cost calculation. LaFave argued that NorthWestern would not incur the interconnection network upgrade costs but for buying Greycliff's output, and that its avoided cost calculation should reflect these costs, otherwise its customers would not be indifferent to buying Greycliff's output. He stated that the levelized deduction should be $4.54/MWh.

LaFave prefiled revised supplemental response testimony to update NorthWestern's avoided cost calculation for project modifications. Greycliff requested to change its commercial operation date from 2016 to 2018, and adjusted project output from 96,000 to 88,044 MWh/yr. To accommodate the first modification, NorthWestern changed the starting date of the forward price curve input used in its model from July 6, 2015 to January 15, 2016. He stated that the 25 year levelized market price of the later price curve was $4.65/MWh lower than the initial curve, and that this reduced avoided costs by $3.80/MWh.

The reduction to project output affected the estimated cost of displaced energy, and also affected the per unit prices of network upgrades, regulation, and reserves. The net change to the avoided cost with carbon due to the reduction in output was a reduction of $0.70/MWh.

LaFave also added a capacity value to the avoided cost calculation in his revised supplemental response testimony. The capacity value is based upon the ownership costs of a reciprocating internal combustion engine generator, $151.37/kW-yr, to begin in 2019. NorthWestern assumed the capacity contribution to be 5% of the project's 25 MW interconnection capacity. Under these assumptions, the estimated levelized capacity value is $1.98/MWh.

The table below illustrates NorthWestern's evolving avoided price calculations as described in the various testimonies of Mr. LaFave.

**NorthWestern Avoided Cost Calculations as Testified by Bleau LaFave**

| | Response Testimony | | Supplemental Response Testimony | | Revised Supplemental Response Testimony (Corrected 5/12/2016) | |
|---|---|---|---|---|---|---|
| | No Carbon Adder | Carbon Adder | No Carbon Adder | Carbon Adder | No Carbon Adder | Carbon Adder |
| Firm Energy | $ 33.66 | $ 42.82 | $ 33.66 | $ 42.82 | $ 31.49 | $ 43.28 |
| DA Firm vs. RT price | (2.23) | (2.23) | (2.23) | (2.23) | (1.99) | (1.99) |
| Interconnection Network Upgrades | - | - | (4.54) | (4.54) | (5.40) | (5.40) |
| Transmission Network Upgrades | - | - | - | - | - | - |
| Capacity Value | - | - | - | - | 1.98 | 1.98 |
| Regulation - 25 Year Levelized | (0.49) | (0.49) | (0.49) | (0.49) | (0.52) | (0.52) |
| Spinning Reserve Service | (0.53) | (0.53) | (0.53) | (0.53) | (0.61) | (0.61) |
| Supplemental Reserves Service | (0.97) | (0.97) | (0.97) | (0.97) | (1.09) | (1.09) |
| Total | $ 29.43 | $ 38.58 | $ 24.89 | $ 34.04 | $ 23.86 | $ 35.65 |

NorthWestern submitted alternative avoided cost estimates in response to discovery. In response to DR GWP-012 it calculated avoided costs using its original, July 2015 electricity market price forecast, the Northwest Power Conservation Council (NPCC) mid-range natural gas price forecast, and without a deduction for interconnection network upgrades. In response to DR PSC-051b, NorthWestern used CU4 variable cost as avoided cost in all cases when supply was long. In response to DR PSC-051c, it used market price as avoided cost in all cases when supply was long. In response to DR PSC-052, NorthWestern modeled three cases using its 2015 Procurement Plan's Economically Optimal Portfolio (EOP) as the base portfolio. Case 1 used the highest cost curtailable resource as the avoidable resource when supply was long. Case 2 used market price as the avoidable cost when supply was long, and Case 3 used the lesser of market or the highest cost avoidable resource when supply was long. The table below illustrates these alternatives.

| NorthWestern Avoided Cost Calculations as Submitted in Response to Data Requests | | | | | | |
|---|---|---|---|---|---|---|
| | DR GWP-012 July '15 Fwd Prices NPCC Gas Forecast No IC upgrade Costs | | DR PSC-051b Modeled Using CU4 Variable Cost when Supply is Long | | DR PSC-051c Modeled Using Forecast Market Price when Supply is Long | |
| | No Carbon Adder | Carbon Adder | No Carbon Adder | Carbon Adder | No Carbon Adder | Carbon Adder |
| Firm Energy | $ 38.69 | $ 49.83 | $ 31.61 | $ 43.93 | $ 35.10 | $ 45.03 |
| DA Firm vs. RT price | (1.99) | (1.99) | (1.99) | (1.99) | (1.99) | (1.99) |
| Interconnection Network Upgrades | - | - | (5.02) | (5.02) | (5.02) | (5.02) |
| Transmission Network Upgrades | - | - | - | - | - | - |
| Capacity Value | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 |
| Regulation - 25 Year Levelized | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) |
| Spinning Reserve Service | (0.61) | (0.61) | (0.61) | (0.61) | (0.61) | (0.61) |
| Supplemental Reserves Service | (1.09) | (1.09) | (1.09) | (1.09) | (1.09) | (1.09) |
| Total | $ 36.47 | $ 47.60 | $ 24.36 | $ 36.68 | $ 27.85 | $ 37.78 |
| | DR PSC-052bi 2015 Plan EOP Highest Cost Resource when Supply is Long | | DR PSC-052bii 2015 Plan EOP Market Price when Supply is Long | | DR PSC-052biii 2015 Plan EOP Lesser of HCR or Market when Supply is Long | |
| | No Carbon Adder | Carbon Adder | No Carbon Adder | Carbon Adder | No Carbon Adder | Carbon Adder |
| Firm Energy | $ 31.24 | $ 41.24 | $ 36.38 | $ 46.31 | $ 31.48 | $ 43.80 |
| DA Firm vs. RT price | (1.99) | (1.99) | (1.99) | (1.99) | (1.99) | (1.99) |
| Interconnection Network Upgrades | (5.02) | (5.02) | (5.02) | (5.02) | (5.02) | (5.02) |
| Transmission Network Upgrades | - | - | - | - | - | - |
| Capacity Value | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 | 1.98 |
| Regulation - 25 Year Levelized | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) | (0.52) |
| Spinning Reserve Service | (0.61) | (0.61) | (0.61) | (0.61) | (0.61) | (0.61) |
| Supplemental Reserves Service | (1.09) | (1.09) | (1.09) | (1.09) | (1.09) | (1.09) |
| Total | $ 23.99 | $ 33.99 | $ 29.14 | $ 39.06 | $ 24.23 | $ 36.55 |

In response to DR PSC-053 NorthWestern estimated avoided costs using the blended Market-CCCT model approved in Docket No. D2012.1.3, Order No. 7199d, assuming the use of a 348 MW GE combined cycle combustion turbine installed in 2025 as described in the 2015 Plan. Using this method and assuming no carbon costs, NorthWestern estimated an off-peak wind rate of $29.99/MWh, on-peak wind rate of $38.07/MWh, and average rate of $31.87/MWh. Assuming carbon costs, NorthWestern estimated an off-peak wind rate of $32.17/MWh, on-peak wind rate of $40.25/MWh, and average rate of $34.05/MWh.

4. NorthWestern Response - Patrick J. DiFronzo

Patrick DiFronzo, NorthWestern's Manager of Regulatory Affairs, prefiled supplemental response testimony to explain the revenue requirement model used to calculate the effect of interconnection

network upgrade costs on Greycliff's avoided cost. The model estimated the 25 year levelized rate of the interconnection network upgrades to be $4.54/MWh.

The assumptions used to derive this rate included a total estimated cost of $3,565,955 to be rate based in 2016, a 6.91% rate of return, and a property tax expense factor of 3.25%. The upgrades were depreciated according to the results of NorthWestern's most recent depreciation study, with book lives of 15, 40, and 45 years depending upon asset type. Assets were depreciated for tax purposes using either the 7 or 15 years MACRS.

5. Montana Consumer Counsel Response - Jaime T. Stamatson

Jaime Stamatson, MCC economist, prefiled direct testimony expressing concerns regarding Greycliff's use of avoided cost and wind integration rates from past dockets that would not represent NorthWestern's current costs. He also testified that NorthWestern needs dispatchable peak power, which Greycliff cannot provide.

Stamatson testified that Greycliff's proposed rate was not based upon a current avoided cost calculation. He asserted that NorthWestern's recent acquisition of hydroelectric generation, and the general decline in electricity market prices since 2013, would likely result in lower current avoided costs than were estimated in the Greenfield docket.

Stamatson testified that if the Commission finds an LEO, the finding may make challenging future recovery of Greycliff-related costs more difficult, including challenges to prudency. He contended that an LEO finding should not imply that the contract price is prudent.

6. Greycliff Rebuttal - Roger Schiffman

Roger Schiffman, Managing Director of Power Markets Research Group (PMRG), prefiled rebuttal testimony on behalf of Greycliff. Schiffman was hired by National Renewable Energy Solutions and Greycliff to review NorthWestern's avoided cost projections and methodology. PMRG developed alternative estimates of avoided cost, using the natural gas price forecast from the U.S. Energy Information Administration's 2015 Annual Energy Outlook, and using an alternative fundamental electricity price forecast prepared by the Northwest Power and Conservation Council (NPCC). PMRG's levelized avoided cost projections are $53.39/MWh for the NPPC case, and $80.82/MWh using a scenario with carbon and the EIA natural gas projections.

Schiffman summarized the requirements of PURPA, stating that "PURPA requires utilities to purchase QF power at a nondiscriminatory, just and reasonable rate that does not exceed the purchasing utility's avoided cost…A utility's full avoided cost includes incremental costs of electric energy, capacity, or both that, if not for the purchase from the QF, the utility would purchase or generate itself."

Schiffman believes that, even though NorthWestern's QF-1 Tariffs only apply to QF projects that are 3 MW or less, they provide some information to developers of larger renewable energy projects about what to expect in terms of avoided cost. The QF-1 tariffs would result in an avoided cost reduction equal to $1.49/MWh for wind integration and contingency reserve charges.

Schiffman asserted that NorthWestern's calculated avoided cost for Greycliff, $34.09/MWh, is lower than the standard offer avoided costs available to wind projects 3 MW or less, and the proposed deductions for wind integration and operating reserves are considerably larger than the deductions in the QF-1 tariffs. NorthWestern's estimated avoided cost is also $20/MWh less than the rate set for the Greenfield project, which was $53.99/MWh.

Schiffman testified that NorthWestern's DRR avoided cost approach differs from a normal DRR approach because NorthWestern only used PowerSimm to calculate the net purchase and net sales positions on a monthly basis with and without Greycliff, rather than to assess production cost differences with and without Greycliff.

Another concern Schiffman has with NorthWestern's avoided cost calculation is its use of the variable cost of CU4 when NorthWestern is in a net sales position and the market price of energy is higher than the variable operating cost of CU4. Schiffman stated that when NorthWestern is in that position, instead of reducing CU4 generation, it should continue operating both CU4 and Greycliff, and sell the additional energy into the market.

Schiffman stated that NorthWestern's avoided cost methodology is not transparent and is difficult to access. While NorthWestern did provide the natural gas and power price curves in response to Greycliff data requests, it did not provide any detail about the process used to develop those curves. NorthWestern also did not provide information about the algorithms used in its PowerSimm models, the specification of probability distributions and correlation and covariance statistics, or other key input data.

Schiffman feels that by using Mid-C Historical Price Series, NorthWestern departs from the Commission's direction to use the InterContinental Exchange (ICE) prices at Mid-C, and that the historical prices understate NWE's avoided costs. NWE used the Powerdex data in its avoided cost estimates, which averages $2.48/MWh lower than ICE across all hours.

Schiffman testified that NorthWestern and the Commission should reconsider using the AECO hub in Alberta to establish market prices. He stated that Stanfield is a more appropriate hub to use, as all of the major natural gas pipelines in the Pacific Northwest intersect there, and so it reflects a blended combination of natural gas supply basins. Historically, AECO prices have been on average $5.00/MWh lower than prices at Stanfield.

Schiffman testified that stochastic models such as PowerSimm cannot account for variables that contribute to structural change in the fuel and power markets, such as the advent of shale gas production, the effect of EPA policies on the electric generation supply mix, wide-scale penetration of wind and solar resources, and lower natural gas prices and emissions driving an increase

demand for natural gas. Schiffman stated that because PowerSimm is unable to account for these variables, it materially understates the natural gas and energy price levels in the market, and that most major consulting firms that develop long-term fuel and power price forecasts use structural simulation models rather than statistical models.

PMRG believes that NorthWestern and the Commission should use NPCC's electricity price forecast to determine Greycliff's avoided cost, as it reflects recent declines in natural gas prices and reflects the structural changes that the power industry is undergoing. As stated earlier in his testimony, NPCC's electricity price forecast results in a levelized avoided cost of $53.39/MWh.

Schiffman disputed the inclusion of several downward adjustments NorthWestern made to its avoided cost for Greycliff. The first adjustment is a $2.23/MWh deduction for the difference between Day-Ahead Firm power prices and Real-Time power prices. NorthWestern treated Greycliff as a non-firm resource by attributing it with a zero capacity value, whereas past Commission Orders assigned a 15% capacity credit to wind resources, and more recently assigned wind resources a 5% capacity credit. Schiffman also disputed this deduction because he claimed there is no formal real-time energy market at the Mid-C, and that most major power providers in the Pacific Northwest rely upon hydro assets and owned generation to provide balancing and regulation services rather than "real-time" transactions at Mid-C.

Schiffman testified that the $4.54/MWh deduction for Transmission Network Upgrades proposed by NorthWestern violates non-discrimination policies established by FERC, because it discriminates against QF resources. FERC transmission policy assigns the cost of network upgrades to project developers during the development stage, but requires the transmission provider to refund those costs with interest when the project achieves commercial operation.

Schiffman stated that wind integration costs are already reflected in NorthWestern's model, but with precedent in Commission policy. In its most recent avoided cost decision, the Commission directed a $1.49/MWh adjustment based on NorthWestern's W1-1 and CR-1 tariffs, which is less than the $1.95 adjustment proposed by NorthWestern for Greycliff in the current proceeding.

NorthWestern updated its avoided cost calculation in its supplemental March 2016 testimony. Schiffman stated that the updated commercial operation date and updated estimated energy production levels from Greycliff are appropriate adjustments. Schiffman also agreed with the adjustment NorthWestern made to include a capacity value for Greycliff, which increased NorthWestern's avoided cost for Greycliff by $1.98/MWh. Schiffman disagreed with NorthWestern's decision to change the date of the forward power price forecast to January 15, 2016, rather than July 6, 2015, which reduced NorthWestern's levelized avoided cost projection by $3.80/MWh. Schiffman believes the date when Greycliff established an LEO is more appropriate for use in developing the avoided cost than the updated January 15, 2016 date.

NorthWestern's projected levelized avoided cost for Greycliff provided in its supplemental March 2016 testimony was $36.04/MWh. Schiffman testified that Greycliff requested an alternative calculation in GWP-012 (revised), using the July 6, 2015 power price forecast date, the NPCC

Medium Natural Gas Price Forecast, and removing the transmission network upgrade costs. These changes resulted in a levelized avoided cost of $47.60/MWh.

Schiffman stated that NorthWestern's use of the NPCC Medium Natural Gas Price Forecast is not accurate, as it labels prices in constant year dollars with no inflation adjustment. Since the avoided cost projections for Greycliff are prepared in nominal, or current year dollars, Schiffman testified that it is appropriate for Greycliff to apply a 2% annual general inflation rate adjustment to the NPCC natural gas prices.

Schiffman found that NWE's avoided cost estimate is not reasonable, as it lacks transparency and clarity regarding the PowerSimm model and statistical parameters used, and he believes that NorthWestern's original and updated avoided cost estimates understate Greycliff's actual avoided cost. Schiffman believes that a levelized avoided cost of $53.39/MWh is more accurate. PMRG's forecast reflects the NPCC medium level electricity price forecast, wind integration charges of $1.49, and a 5% capacity credit for Greycliff based on the avoided capital cost of an LMS100 simple cycle power plant.

PMRG also developed a model based on the EIA's 2015 Annual Energy Outlook natural gas price forecast, which produced an avoided cost of $80.82/MWh.

The table below illustrates Schiffman's proposed avoided cost calculations.

**Greycliff Proposed Avoided Cost Calculations**
**Roger Schiffman Rebuttal Testimony**

| | NPCC Forecast | NWE Forecast AEO Gas Prices |
|---|---|---|
| Firm Energy | $ 53.10 | $ 80.54 |
| DA Firm vs. RT price | - | - |
| Interconnection Network Upgrades | - | - |
| Transmission Network Upgrades | - | - |
| Capacity Value | 1.78 | 1.78 |
| Regulation - 25 Year Levelized | (0.89) | (0.89) |
| Spinning Reserve Service | - | - |
| Supplemental Reserves Service | (0.61) | (0.61) |
| Total | $ 53.39 | $ 80.82 |

7. NorthWestern Surrebuttal

NorthWestern may prefile surrebuttal testimony on or before May 24, 2016.